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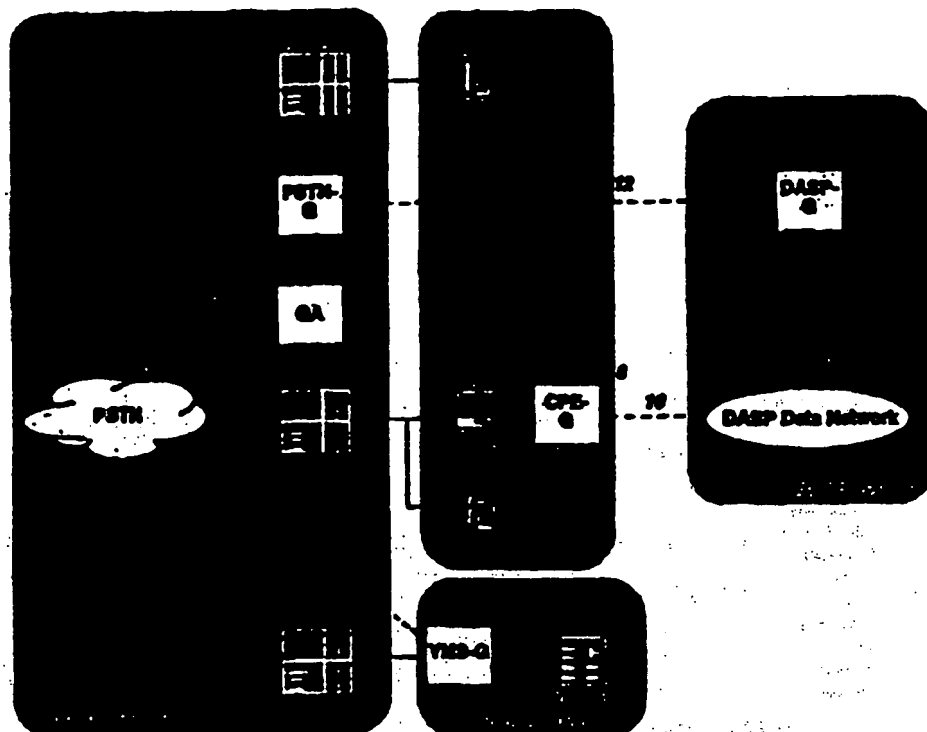## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : H04M 3/42, 3/00, 3/50	A1	(11) International Publication Number: WO 98/07266
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(54) Title: INTERNET-BASED TELEPHONE CALL MANAGER

(57) Abstract

A method is provided that allows data access service provider subscribers to manage their telephone service through a data connection. The subscriber is enabled to obtain call data information and is provided real-time control. During a data call, a visual incoming call indicator informs the subscriber, through a pop-up window, connected to the data access service provider that there is a call attempt. A visual message waiting indicator allows a subscriber, connected to the data access service provider to be notified of a pending message on the voice message system. A visual call disposition allows the subscriber, through the data connection, to dispose of calls. The call disposition options include forwarding a call to voice mail, playing an announcement to the calling party, forwarding the call to another line, sending a text message which could be converted to speech using text to speech technology, answering the call using voice over data call or terminating the data connection in order to accept the call.

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terminal, responsive to receiving the signal, an incoming
call indication.

According to another aspect of the present
invention there is provided a method of providing an
5   indication of a message waiting at a voice messaging
service to a called station coupled to a telecommunications
network, the called station having a data processing
terminal engaged in a data call with a data communications
network, the data call being through a connection in the
10   telecommunications network to an access gateway for the
data network, the method comprising the steps of providing,
by the telecommunications network, an incoming call
intended for the called station to a voice messaging
service whereby the incoming call may record a message,
15   providing a signal advising of the message waiting from the
access gateway, over the data call connection through the
telecommunications network, to the data processing terminal
and generating by the data processing terminal, responsive
to receipt of the signal, the message waiting indication.
20   According to a further aspect of the present
invention there is provided a method of disposing of an
incoming call intended for a called station coupled to a
telecommunications network, the called station having a
data processing terminal engaged in a data call with a data
25   communications network, the data call being through a
connection in the telecommunications network to an access
gateway for the data network, the method comprising the
steps of holding call processing of the incoming call at a
switching system in the telecommunications network,
30   providing a signal advising of the incoming call from the
access gateway, over the data call connection through the
telecommunications network, to the data processing
terminal, receiving from the data processing terminal, via
the access gateway, instructions for disposing of the
35   incoming call and continuing the call processing of the
incoming call at the switching system according to the
received instructions.

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cannot check if they have pending messages without terminating their session. The visual message waiting indicator allows them to be informed of their mailbox status within their Internet session.

5

Terminology and acronyms
   • Caller
     Person that calls the subscriber. The caller can reach the subscriber in two ways, either directly, i.e., the
10 caller dials the subscriber's DN, or indirectly, i.e., the caller dials a DN that is forwarded to the subscriber's DN.
   • Data Access Service Provider (DASP)
     Data network operator that sells access services to its
15 data network that allows the subscribers to communicate through the DASP's network and other data networks.
   • DASP user
     Person that subscribes to and uses DASP services.
   • Forwarding from station number (FF)
20 Parameter conveyed over the control between the PSTN and the VMS system and used by the VMS system as the mailbox identifier.
   • Subscriber
     A DASP user that subscribes also to the Call Manager
25 service.
   • VMS subscriber
     Person that subscribes to a VMS.

Acronyms
30 • BRI - Basic Rate Interface
   • CPE - Customer Premise Equipment
   • DASP - Data Access Service Provided
   • DN - Directory Number
   • ICM - Internet Call Manager
35 • ISDN - Integrated Services Digital Network
   • ISP - Internet Service Provider
   • MWI - Message Waiting Indicator

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Telephone Network (PSTN) and Data Access Service Provider
(DASP) enhanced signalling and data communication
capabilities to provide incoming call information and
control to a DASP subscriber.

5   In the following descriptions, specific instances
of the PSTN enhanced signalling capabilities are used for
the purpose of describing the concept. However, those
skilled in the art will recognize that the scope of this
invention is not limited to these specific instances. To
10 ease description, functional call flows are used.
Brief Description Of The Drawings

The present invention will be further understood
from the following description with reference to the
drawings in which:
15   Fig. 1 illustrates an overview of a network in
which the method in accordance with the present invention
can be used;

Figs. 2 and 3 graphically illustrate the call-
indication functional flow in accordance with another
20 embodiment of the present invention;

Fig. 4 graphically illustrates the call-indication
functional flow in accordance with a further embodiment;

Fig. 5 graphically illustrates the message waiting
indication functional flow in accordance with a further
25 embodiment of the present invention;

Fig. 6 graphically illustrates the message waiting
indication functional flow in accordance with an additional
embodiment of the present invention;

Figs. 7 and 8 graphically illustrate the incoming
30 call disposition functional flow in accordance with a still
further embodiment of the present invention.
Detailed Description

Referring to Fig. 1 there is provided a view of
the network components and interfaces required by this
35 method. The network components are grouped into four (4)
domains, i.e., the PSTN domain, the DASP domain, the Voice
Message Service - Service Provider (VMS-SP) domain and the

The PSTN Gateway Agent (GA) [19] is the PSTN component that provides the PSTN-G [4] with the incoming call information and remote call control for incoming calls to registered subscribers [17].

The VMS-SP's VMS gateway's (VMS-G) [5] responsibility is to provide the PSTN gateway [4] with the MWI information for registered subscribers [17].

The DASP gateway (DASP-G) [6] is the DASP component that implements the PSTN-DASP signalling. Through interface [12], the DASP gateway obtains from the PSTN gateway [4] the incoming call indication and control for all registered subscribers [17]. The main responsibility of the DASP gateway is then to mediate, through interface [9], DASP data network [8] and interface [10], with the subscriber's [17]. For call disposition service, the CPE gateway receives the subscriber's inputs from the HMI and translates the call disposition request in the appropriate message format for delivery to the DASP gateway [6].

The above components can be implemented in various ways. A single component can be implemented as a stand-alone network equipment, multiple components can be combined in a single network equipment or a given component can be partitioned over two (2) or more network equipments.

In the following sections, methods and systems are described which implement the service components of this invention, namely, call indication, MWI delivery and call disposition. However, the scope of this invention is not limited to these implementations, which are merely illustrative. Finally, for each service component, a specific service scenario issued for simplicity of description only. The invention is not limited to these service scenarios.

The following data is used in the functional flows:

• caller's DN is Dnc
• caller's name is Name_c

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message. The PSTN-G[4] can then provide the DASP-G[6] with
the required incoming call indication information. The
DASP G[6], through a standard data communication protocol,
including but not limited to TCP/IP, HTTP and FTP,
5   communicates the information to the CPE-G[18]. This
information is then formatted and displayed to the user.

The terms used are:
- TA: AIN Termination_Attempt trigger
10 - TA: AIN Termination_Attempt SSP-SCP message
- A_T: AIN Authorize_Termination SCP-SSP message
- IAM: SS7 ISUP Initial Address Message
- ACM: SS7 ISUP Address Complete Message
- ANM: SS7 ISUP Answer Message
15 - FF: SMDI Forwarded From number
- CdPN: Called Party Number parameter
- CgPN: Calling Party Number parameter
- CgName: Calling Party Name parameter
- OCN: Originally Called Number parameter
20 - RDI: Redirecting Indicator parameter
- RDN: last Redirecting Number parameter
- RgName: Redirecting Name parameter
        Other implementations of this method to deliver
the call indication service component are possible. They
25 include but are not limited to the following one.
Referring to Fig. 4 there is illustrated an embodiment of
the present method. In this implementation of the
invention, the GA[19] is implemented using the SSP-based
[2] Call Forward Busy (CFB) telephony feature, the PSTN[4]
30 component is implemented by a PSTN SSP and the PSTN
signalling capabilities used are:
- the Signalling System #7 (SS7) Integrated Services
  Digital Network User Park (ISUP) as interface [11] and
  [20]
35 - the Integrated Services Data Network - Basic Rate
  interface (ISDN-BRI) as interface [12]

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protocol as interfaces [11] and [13]. A possibility is for
the PSTN-G[4], when an incoming call has been detected
using method described in regard to Figs. 2 and 3.
Incoming call indication, to start a timer set at the
5   subscriber's [17] maximum allowed message length. At time-
out, PSTN-G [4] sends an AIN non-call related Query_Request
to SSP [2] requesting for status of subscriber's [17]
MWI.SSP [2] answers with the AIN Query_Response with an
on/off activation status code parameter. The PSTN-G[4]
10   then provides the DASP-G [6] with the MWI information if
necessary. The DASP-G [6], through a standard data
communication protocol, including but not limited to
TCP/IP, HTTP and FTP, communicates the information to the
CPE-G [18]. This information is then formatted and
15   displayed to the user.

The terms used are:
- Q_Req: SS7 AIN
- QUERY_REQUEST SCP-SSP message
20   - Q_Resp: SS7 AIN Query_Response SSP-SCP message
- P_I: AIN Provide_Info parameter
- I_P: AIN Info-Provided parameter
         Other implementations of this method to delivery
the MWI delivery service component are possible. They
25   include but are not limited to the following one.
Referring to Fig. 6 there is illustrated an additional
embodiment of the present invention, the VMS-G [5]
component is implemented as an SMDI monitoring tool, the
PSTN-G [4] component is implemented by a PSTN SSP and the
30   PSTn signalling capabilities used are:
- the Signalling System #7 (SS7) Transaction Capability
  Application Part (TCAP) as interfaces [11] and [13]
- the Integrated Services Data Network - Basic Rate
  Interface (ISDN-BRI) as interface [12]
35   - the Simplified Message Desk Interface (SMDI) for PSTN to
  VMS system signalling.

- . TAT: AIN Termination_Attempt trigger
- T_A: AIN Termination_Attempt SSP-SCP message
- S_t-R: AIN Send_To_Resource SCP-SSP message
- C_R_E: AIN Cancel_Resource_Event SCP-SSP message
5 - R_C: AIN Resource_Clear SSP-SCP message
- A_T: AIN Authorize_Termination SCP-SSP message

As discussed above with regard to Figs. 2 and 3:
Incoming call indication, the AIN call model on SSP [2]
detects incoming calls to subscriber's DN using the
10 Termination_Attempt trigger. The AIN call model also
provides the remote call control capability required by the
PSTN-G to control call establishment as required by the
call disposition service component. To prevent situations
where the caller hangs up for waiting too long, the
15 subscriber [17] has a limited time windows (Call_Disp_Timer
expires, a default treatment is provided (e.g., route to
VMS). Finally, the other options of the call disposition
service component (route to DN, route to VMS, route to
announcement, route to canned messages, ...) can be
20 implemented using the AIN Forward_Call PSTN-G[4] response
to the SSP instead of the Authorize_Termination response.

Those skilled in the art will recognize that
various modifications and changes could be made to the
invention without departing from the spirit and scope
25 thereof. It should therefor be understood that the claims
are not to be considered as being limited to the precise
embodiments set forth above, in the absence of specific
limitations directed to each embodiment.

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through the telecommunications network, to the data
processing terminal; and

        generating by the data processing terminal,
responsive to receipt of the signal, the message waiting
5   indication.

4.   A method as claimed in claim 3, wherein the signal
is a message including information relating to the incoming
call.
10

5.   A method as claimed in claim 4, wherein the
message includes information relating to the recorded
message.

15 6.   A method of disposing of an incoming call intended
for a called station coupled to a telecommunications
network, the called station having a data processing
terminal engaged in a data call with a data communications
network, the data call being through a connection in the
20 telecommunications network to an access gateway for the
data network, the method comprising the steps of:
        holding call processing of the incoming call at a
switching system in the telecommunications network;
        providing a signal advising of the incoming call
25 from the access gateway, over the data call connection
through the telecommunications network, to the data
processing terminal;
        receiving from the data processing terminal, via
the access gateway, instructions for disposing of the
30 incoming call; and
        continuing the call processing of the incoming
call at the switching system according to the received
instructions.

35 7.   A system for interconnecting a telecommunications
network and a data communications network, comprising:

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11.   A method as claimed in claim 8 wherein the message indicative of an incoming call is an ISDN message.

12.   A method as claimed in claim 8 wherein the message
5   indicative of an incoming call is a call waiting indication.

13.   A method as claimed in claim 8 wherein the message indicative of an incoming call is a voice message
10   indication.

14.   A method as claimed in claim 8 wherein the step of disposing of the incoming call includes forwarding the call to voice mail.
15

15.   A method as claimed in claim 14 wherein the step of disposing of the incoming call includes playing an announcement to the calling party.

20   16.   A method as claimed in claim 14 wherein the step of disposing of the incoming call includes forwarding the call to another line.

17.   A method as claimed in claim 14 wherein the step
25   of disposing of the incoming call includes sending a text message.

18.   A method as claimed in claim 14 wherein the step of disposing of the incoming call includes answering the
30   call using voice over the data call.

19.   A method as claimed in claim 14 wherein the step of disposing of the incoming call includes terminating the data call and accepting the incoming call.
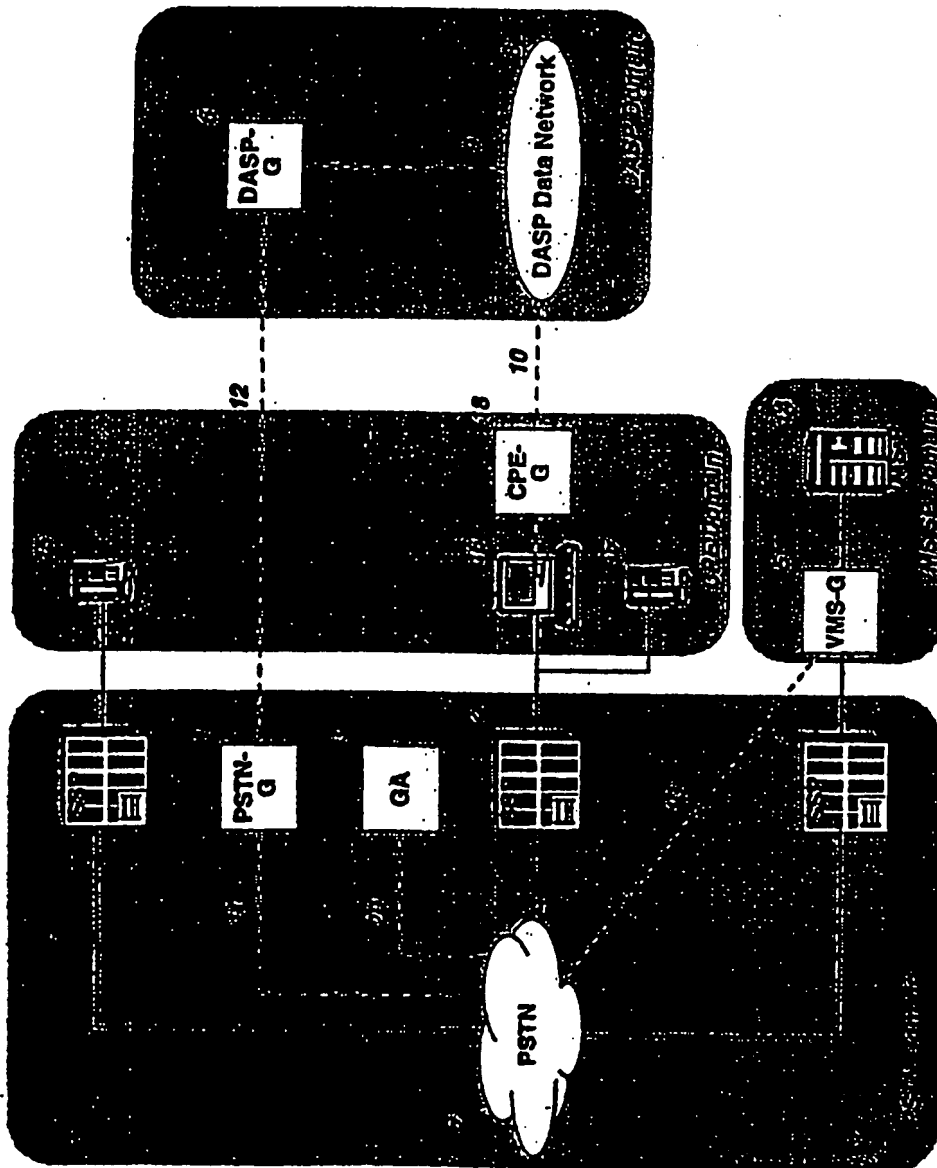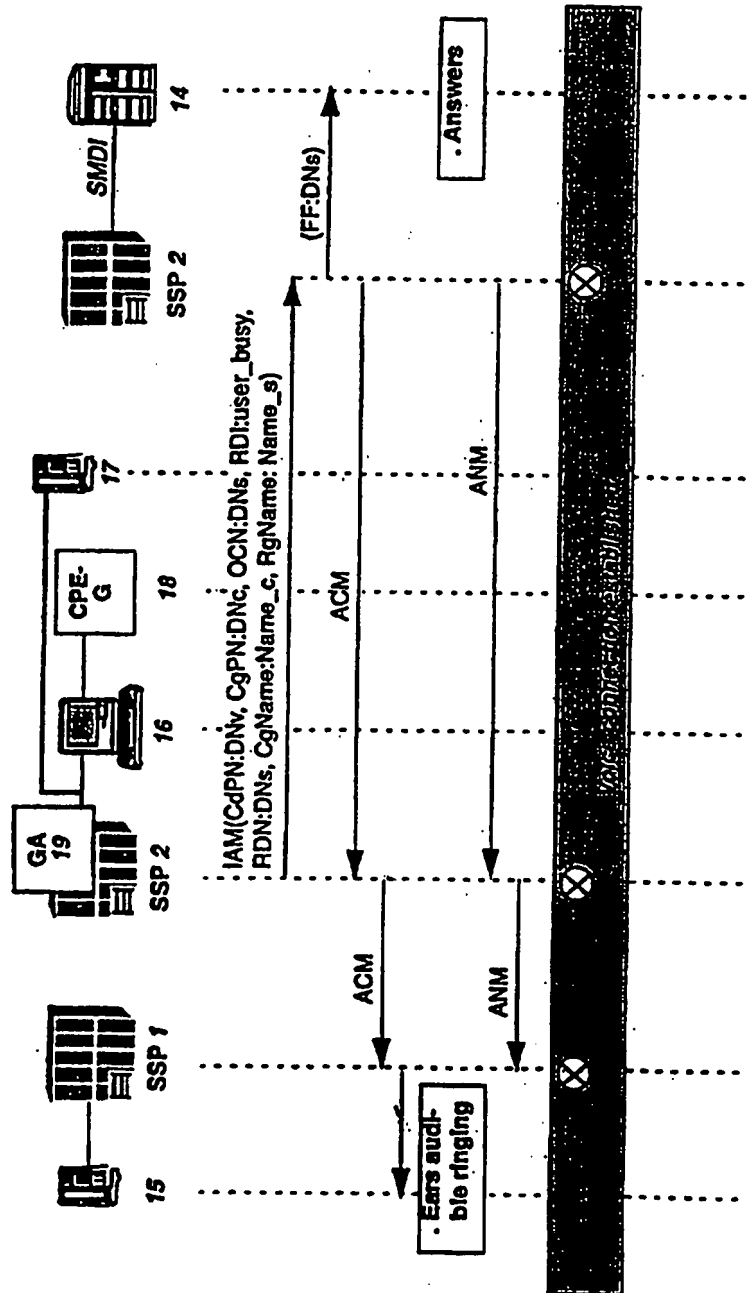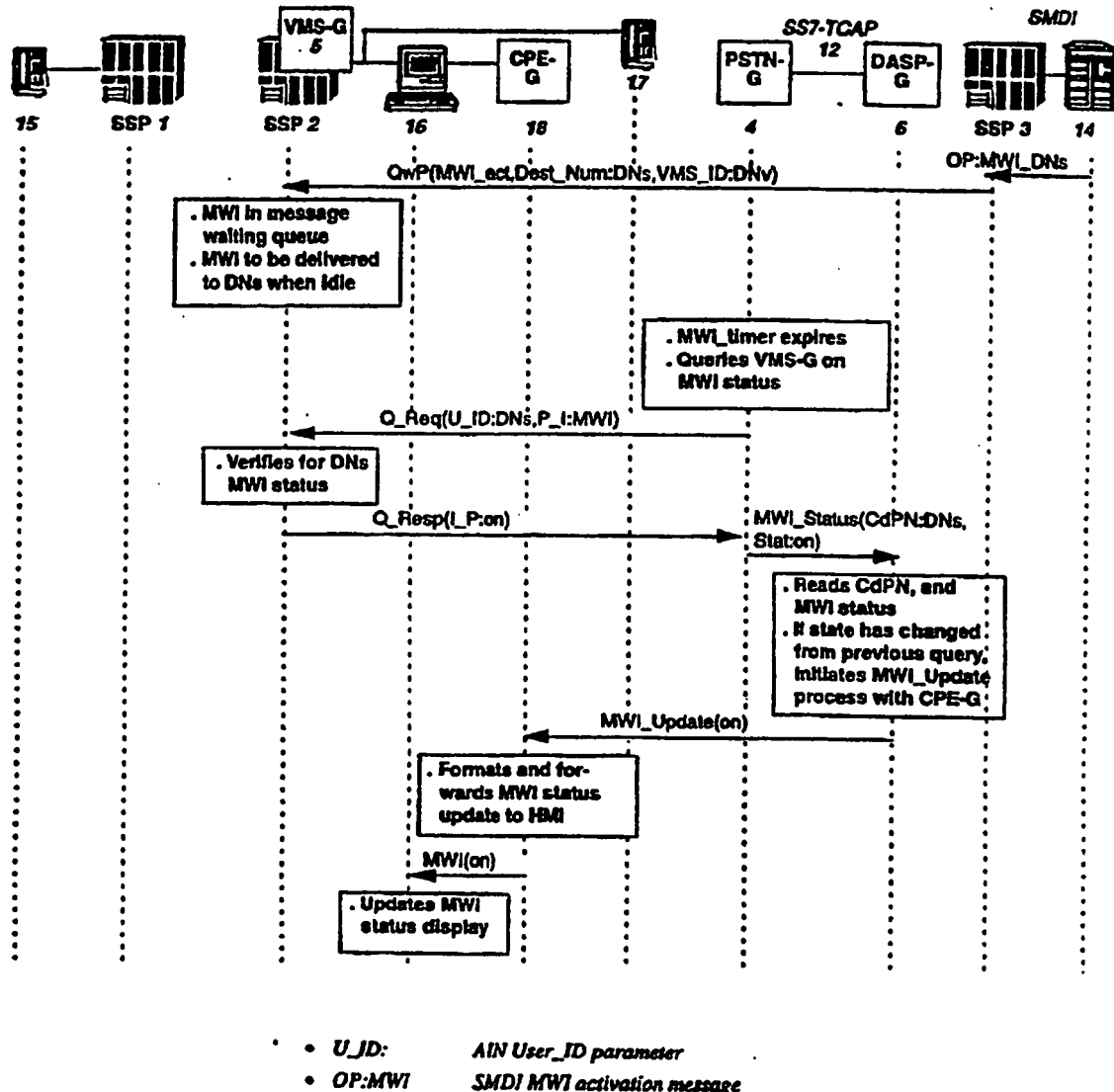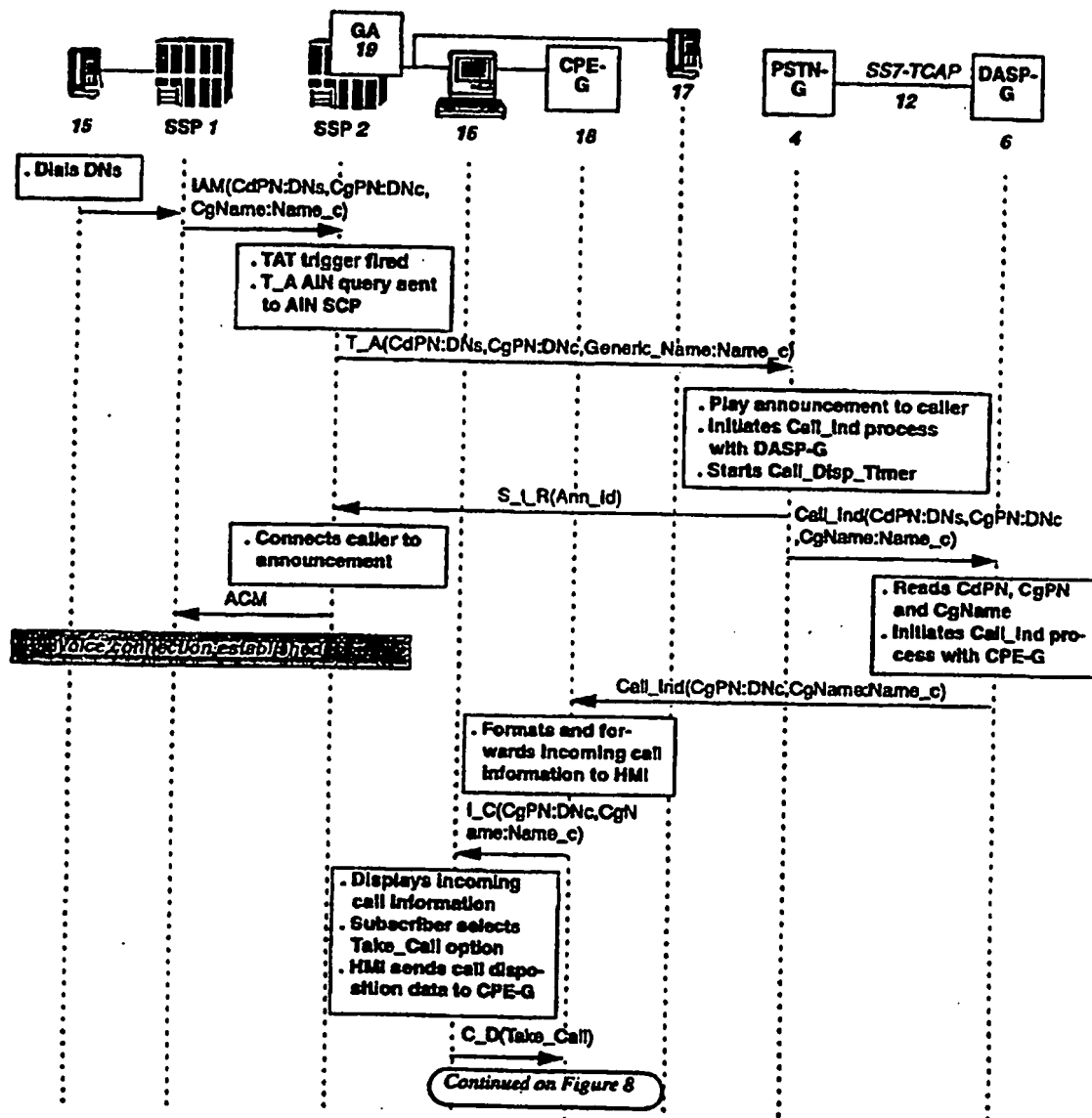35

FIGURE 1

FIGURE 3

FIGURE 5

FIGURE 7

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6   H04M3/42   H04M3/00   H04M3/50

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6   H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 533 110 A (PINARD DEBORAH L ET AL) 2 July 1996 see column 6, line 11 - column 7, line 8 see figures 1,8	1,2,6,8,12
Y	"WORKSTATION COMMUNICATIONS SYSTEM" IBM TECHNICAL DISCLOSURE BULLETIN, vol. 37, no. 9, 1 September 1994, pages 101-104, XP000473347 see the whole document	3-5
Y	WO 95 18501 A (GTE LABORATORIES INC) 6 July 1995 see the whole document	3-5
	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 December 1997	30/12/1997

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl. Fax: (+31-70) 340-3016	Megalou, M

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